

EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF ORDINARY STONE AND GRAVEL QUARRY

(As per EIA Notification, 2006 dated 14.09.2006 and amendments)

Category: B₁

Extent : 5.61.0 Ha

S. F. Nos. : 236/5, 236/7, 297/1A... and 298/2B3

Village: Keelaramanathi

Taluk : Kamuthi

District : Ramanathapuram

PROPONENT

Thiru. M.Saranraj

S/o. MuthuRamu,

Chinnaodappankulam,

ValayaPookkulam (po), KamuthiTaluk,

Ramanathapuram District.

CONSULTANT

AADHI BOOMI MINING & ENVIRO TECH (P) LTD

(QCI/NABET Accredited EIA Organization)

3/216, K.S.V nagarNarasothipatti,

Alagapuram(po), salem – 636004

Website: www.abmenvirotechc.com

Email: abmenvirotech@gmail.com, suriyakumarsemban@gmail.com

Mob: 9842729655, 9443290855

Executive Summary

Thiru.M.Saranraj of Ordinary stone and gravel quarry over an extent of 5.61.0 hectare in S.F. No: 236/5, 236/7, 297/1A, 297/2A, 297/2B, 297/2C, 297/3, 297/2D, 298/2A1, 298/2A2, 298/2A3 298/2B1, 298/2B2 and 298/2B3 is located in Keelaramanathi Village, Kamuthi Taluk, Ramanathapuram District. The area is marked in the survey of India Toposheet No.58k/7. The area lies between northern latitude of 09°23'26.06" to 09°23'25.61"N and eastern longitude from 78°17'49.57" to 78°17'51.31"E. The mining plan was approved in favor Thiru.M.Saranraj vide Roc.no.1169/G&M.2/2017, dated 16.08.2018.

As per the Environmental Impact Assessment (EIA) Notification dated 14th September 2006, the project falls under 1(a) Mining of minerals, Category – B1 in view of lease area >25 and <50 Ha. In view of the above the proponent submitted the application to SEIAA/SEAC on 21.12.2018. The proposal has been placed in 138th STATE APPRAISAL COMMITTEE MEETING on 09.11.2019 and granted Terms of Reference vide Lr. No. SEIAA-TN/F. No.6692/SEAC/TOR-680/2020 dated 10.01.2020.

1.1 SCOPE OF THE PROJECT

The proposal for Environmental Clearance of Ordinary stone mine of **Thiru.M.Saranraj** requires EIA report as per Terms of Reference vide Lr. No. SEIAA-TN/F. No.6692/SEAC/TOR-680/2020 dated 10.01.2020.

1.2 PROJECT DESCRIPTION

Table No 1. 1 Project Details

Project Details	
Proponent	Thiru.M.Saranraj
Total Mine Lease Area	5.61.0 Hectares (Patta land)
Survey No.	236/5, 236/7, 297/1A, 297/2A, 297/2B, 297/2C, 297/3, 297/2D, 298/2A1, 298/2A2, 298/2A3 298/2B1, 298/2B2 and 298/2B3
Site Location	Keelaramanathi Village, Kamuthi Taluk, Ramanathapuram District
Geographical Co-ordinates	Latitude: 09°23'26.06" to 09°23'25.61"N Longitude: 78°17'49.57" to 78°17'51.31"E

Proponent:Thiru.M.Saranraj, Ordinary Stone and Gravel Quarry, Ramanathapuram District

Toposheet No.	58- K/7
Elevation	65m above MSL
Accessibility	
Nearest Habitation	Usilamgulam-1km-South
Nearest Town	Kamuthi-7.1km-North East
Nearest Roadway	SH -47- Kamuthi – Aruppukottai-1.45km-North West
Nearest Railway station	Aruppukottai Railway Station – 26km – North West
Nearest Airport	Madurai Airport - 54km –North West
Environmental Sensitiveness	
Interstate Boundary	Kerala Interstate Boundary – 100 km – West
Coastal Zone	Bay of Bengal –33km (SE) Hence the area does not attract the C.R.Z. Notification, 1991
Reserve Forest	There is no reserve forest or Social forest found around 10km radius Hence the area does not attract the Forest Conservation Act, 1980.
Wildlife sanctuary	No wildlife sanctuary is located within 10km radius. Hence the area does not attract the Wildlife Protection Act, 1972.
Water bodies	Kamuthi lake-NE-3.6km Melayur lake –SW-4.3 km Maraikulam -NE- 5.6 km
Habitations	Talaivanayakkanpatti – 2km – East – 2188 Population Rettappuli – 2km – West – 2079 Population
Defense Installations	Nil within 10km radius
Quarries around 500m radius (AD Letter furnished)	2 Quarry found around 500m radius (6.35.5 Ha) AD Letter. No: Roc.No.G&M.2/1169/2017 dated 13.12.2018.
Seismic Zone	Zone-III, Low damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS: 1893-2002
Mining Details	
Method of Mining	Open Cast – Semi Mechanized Mining Method Hydraulic excavators and Compressed operated jack hammers were used for breaking the rocks. Close spaced drilling of 0.6m was adapted along a straight line and changed with low explosive to avoid feather cracks.
Geological resources	767933 m ³
Mineable reserves	731388 m ³ of Ordinary stone and 50309 m ³ of gravel

Production	138963 m ³ / annum of Ordinary stone and 10061 m ³ /annum of gravel
Topsoil	-
Ordinary Stone Rejects	38434 m ³
Depth of Mining	19m (Proposed)
Water Table	21-24m bgl
Overall Pit Slope	45°
Period of Lease	5 Years for Ordinary Stone for Gravel
Project Cost	Rs48 Lakhs
EMP Cost	Rs 4.80 Lakhs

1.3 Description of the environment

1.3.1 Base line environmental study

Collection of baseline data is an integral part of the preparation of Environmental Impact Assessment reports. The baseline monitoring study has been carried out during the post-monsoon season (October 1st–December 31st, 2019) to assess the existing environmental scenario in the area. For the purpose of EIA studies, quarry lease area was considered as the core zone and area outside the quarry lease boundary up to 10 km radius from the lease boundary was considered as buffer zone.

Table No 1.2 Baseline Data

Particulars	Details	Standards
Meteorology (October 1 st –December 31 st , 2019)		
Rainfall (Avg.)	470.6 mm	--
Temperature (Avg.)	22-34°	--
Wind speed	2.4 m/s	--
Wind Direction	NE & SW directions	
Ambient Air Quality (NAAQS)		
PM ₁₀	51-60 µg/m ³	100 µg/m ³
PM _{2.5}	26-31 µg/m ³	60 µg/m ³
SO ₂	5-7 µg/m ³	80 µg/m ³
NO _x	8-10 µg /m ³	80 µg/m ³
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone – 43.6- 46.2 dB (A) Buffer zone –42- 45.6 dB (A)	Industrial Area Day Time - 75 dB (A) Residential Area

		Day Time – 55 dB (A)
Night time (10:00pm - 06:00 am)	Core zone – 30.9 - 33.6dB (A) Buffer zone – 30.3 - 34.4dB(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	7.06 – 7.20	6.5 to 8.5
TDS	416 - 1780 mg/l	500 mg/l
Total Hardness as CaCO ₃	187-1040 mg/l	200 mg/l
Soil Quality		
pH	7.42 – 7.56	Neutral to moderately alkaline
Bulk density	1.38 – 1.63 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	19mbgl	Quarrying activity 2m to 5m above ground water table
Water Table	21-24m bgl	

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.4.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast quarrying. The quarrying operations will be carried out by adopting semi-mechanized methods which involves drilling, blasting, wire-saw cutting, excavation, loading, hauling and unloading. Apart from above, there will be other activities associated viz. transportation of Ordinary stone and waste, stocking of rejects and dump management within the quarry lease area that may contribute to wash out, slope failure, leachates and other related pollution.

From the results of AERMOD Cloud 5 model, it is concluded the cumulative concentrations of PM10 due to quarrying activities comply with the National Ambient Air Quality Standards (NAAQS 2009). The concentrations of SO₂ and NO_x generated from quarry area are expected to be low due to absence of any major source. It should be noted that the predicted concentrations are due to the simultaneous operations of quarries. The overall impact on air quality due to the quarry project is expected to be low.

1.4.2 Noise Environment

Noise pollution poses a major health risk to the quarry workers. The sources of noise in the existing open cast quarrying project observed include Drilling, Blasting, Operation of HEMM and Vehicular Movements.

The noise generated by the quarrying activity is dissipated within the core zone. This is because of the distance involved and other topographical features adding to the noise attenuation. From the results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS. At present no quarrying activity is carried out. However, the expected noise levels are not likely to have any effect. Precaution will be made to keep down the noise exposure level of 85 dB (A) to the operating personnel for 8 hrs.The charge per blast of 165 kg is well below the Peak Particle Velocity of 5mm/s. However, as per statutory requirement additional control measures needs to be adopted to avoid the impacts due to ground vibrations and fly rocks due to blasting.

1.4.3 Water Environment

Quarrying operations can affect groundwater quality in several ways. The most obvious impact occurs in quarrying below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying waste or other material) into groundwater. The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during the quarrying process. The quarrying activity will not intersect groundwater table.The water sample from core zone is poor on biological testing and the water sample from Keelaramanadhi village is high in Total Hardness, TDS and also poor on logical testing. Based on the Water Quality Index calculated, water quality in both core and buffer zone is poor which is not suitable for the drinking purpose without the proper pretreatment such as reverse osmosis, boiling, Chlorination etc.

1.4.4 Soil Environment

Soil characteristics indicate favorable condition for plant growth. There is only negligible quantity of top soil generated for the entire life of the mine. It is being used for plantation purpose.

1.4.5 Waste Dump

The limited quantity of top soil shall be dumped along 7.5m inner boundary on south-Western and eastern direction of the lease area. The proposed rate of production of Ordinary stone is about 694819m³ and gravel 50309m³ at the rate of 95% recovery up to permissible depth. Total generation of Waste (reject + Gravel) for the next five years will be 86878 m³. The overall mineral to waste ratio for the next five years is 1: 0.12.

1.4.6 Biological Environment

There are no notified endangered species in the area, which may be affected due to the quarry activities; therefore the biological environment will not have significant impact due to quarrying activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around the quarry lease area.

1.4.7 Land Environment

The Ordinary Stone quarry project will result in disturbance of the land use pattern of the quarry lease area. The land degradation is unavoidable during quarrying activities like excavation, overburden dumping, soil extraction etc. So reclamation of quarried land and proper formation of benches will be given due importance. Stagnant water in the quarry pit will help in development of agriculture and afforestation in the buffer zone over a period of time utilizing the water in the quarry pit which shows a positive impact due to quarrying activity.

1.4.8 Socio Economic Environment

The quarrying activity will definitely increase the employment opportunity (directly as well as indirectly) in the project area. Some of these impacts would be beneficial. The expectation of the people of area is concerned towards employment, education, road and health facilities. The literacy rate may be increased with the economic benefits which may arise from the quarrying activities.

Table 1.3 Environmental Management Plan

S.No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Drilling	<ul style="list-style-type: none"> ○ Dust extractor or wet drilling to be followed to control dust at source of emission ○ Use of Sharp drill bits for drilling holes and charging the holes by using optimum charge and using time delay detonator
		Blasting	<ul style="list-style-type: none"> ○ Regular water sprinkling on blasted heaps at regular intervals will help in reducing considerable dust pollution
		Loading	<ul style="list-style-type: none"> ○ Water sprinkling be done before loading by making it moist
		Transportation	<ul style="list-style-type: none"> ○ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ○ Overloading will be prevented ○ Trucks/Dumpers covered by tarpaulin covers
		DG Sets	<ul style="list-style-type: none"> ○ DG sets will be used only during power failure ○ Adequate stack height for DG sets will be provided as per CPCB norms
	General measures	<ul style="list-style-type: none"> ○ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF to control fly of dust. ○ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS. ○ Regular health check-up of workers and nearby villagers in the impacted area should be carried out and also regular occupational health assessment of employees should be carried out as per the Factories Act ○ Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air. 	
2	Water Environment	Surface water	<ul style="list-style-type: none"> ○ Wastewater discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.

Proponent: Thiru. M. Saranraj, Ordinary Stone and Gravel Quarry, Ramanathapuram District

		Ground water	<ul style="list-style-type: none"> ○ The mining activity will not intersect the ground water table ○ Desilting will be carried out before and immediately after the monsoon season
		Storm water	<ul style="list-style-type: none"> ○ Pit will be used for Storage of rainwater ○ Rain water will be collected in sump in the mining pit and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. ○ The proponent will collect and judiciously utilize the rainwater as part of rain water harvesting
		General measures	<ul style="list-style-type: none"> ○ Regular monitoring and analyzing the quality of water
3	Noise Environment	Drilling	<ul style="list-style-type: none"> ○ Limiting time exposure of workers to excessive noise
		Blasting	<ul style="list-style-type: none"> ○ Carrying out blasting only during day time and not on cloudy days ○ Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes. ○ Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
		Transportation	<ul style="list-style-type: none"> ○ Proper and regular maintenance of vehicles, machinery and other equipments. ○ The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. ○ Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles. ○ Adequate silencers will be provided in all the diesel engines of vehicles. ○ Minimum use of horns and speed limit of 10 km/hr in the village area. ○ It will be ensured that all transportation vehicles carry a valid PUC Certificates

Proponent: Thiru. M. Saranraj, Ordinary Stone and Gravel Quarry, Ramanathapuram District

		General measures	<ul style="list-style-type: none"> ○ Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas ○ Provision of Quiet areas, where employees can get relief from workplace noise. ○ The development of green belts around the periphery of the mine to attenuate noise. ○ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.
4	Vibration	Blasting	<ul style="list-style-type: none"> ○ No deep hole blasting envisaged. ○ Small dia shot holes are used for breaking boulders. ○ Specific charge pattern has to be designed by proper trial vibration studies with varying charge ratios as per studies. ○ If the vibration still exceeds the limit a long Trench to a depth of 6m may cut in the direction of wave's movement to break longitudinal waves which travel close to surface, preferably near mine buffer zone ○ In spite of all measures periodical testing of vibration and noise using approved seismograph by DGMS has to be followed as a part of Environmental monitoring
5	Soil Environment	Topsoil	<ul style="list-style-type: none"> ○ Humus top soil shall be preserved for reuse in afforestation and agriculture ○ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the quarry premises ○ Garland drains will be provided around the mine and dumps to arrest any soil from the quarry area being carried away by the rain water. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches
6	Waste Dump	Stabilization of Dumps	<ul style="list-style-type: none"> ○ The limited quantity of top soil shall be dumped along 7.5m inner boundary on south-Western and eastern direction of the lease area. ○ Rejects out of mining about 38434 m³ shall be used as gravel for forming roads.

Proponent: Thiru. M. Saranraj, Ordinary Stone and Gravel Quarry, Ramanathapuram District

7	Plantation	Mineleaseboundary and waste dump	<ul style="list-style-type: none"> ○ Provision of green belt all along the periphery of the lease area for control of dust and to attenuate noise ○ Stabilization of Dump with plantation ○ It is strongly recommended that the loss of plant in each year will be counted and again planted in subsequent plantation. ○ The plant should be planted taken from nursery, where the survival rate is high.
8	Land Environment		<ul style="list-style-type: none"> ○ The restoration of the degraded land would cover backfilling and terracing with the overburden / wastes and surfacing the same with top soil. ○ Provision of Garland drainage around the dumps ○ Fast growing trees and other native shrubs would be planted to stabilize the reclaimed land ○ Appropriate measures will be taken for Green belt development. ○ The rain water will be stored in the pit which will recharge the ground water as a part of rain water harvesting scheme for irrigating the nearby agricultural lands.
9	Socio Economic		<ul style="list-style-type: none"> ○ Good maintenance practices will be adopted for machinery and equipment, which will help to avert potential noise problems. ○ Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines. ○ Drilling, blasting etc at specified location will be followed with proper schedule. ○ Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone. ○ An emergency preparedness plan will be prepared in advance, to deal with firefighting, evacuation and local communication. ○ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices has been provided which meet 'BIS' (Bureau of Indian Standards). ○ As a part of CSR activities, community welfare activities will be undertaken by the proponent which leads to socio economic

			development
10	Occupational Health		<ul style="list-style-type: none">○ First-aid facilities as per provisions under Rule (44) of Mines Rules 1955○ Initial and Periodical medical examination shall be conducted for the employees under Rule 29B & 45 (A).○ Insurance will be taken in the name of the labourers working in the quarry○ Workers involved in quarrying work shall be provided protective equipment's such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc...

1.5 Analysis of Alternatives

The quarrying site is dependent on the geology and mineral deposition of the area. Hence, this project is mineral and site specific and no alternative site considered for this project.

1.6 Environmental Monitoring Program

Success of any environmental management programme depends upon the efficiency of the organizational set up responsible for the implementation of the programme. Regular monitoring of the various environmental parameters is also necessary to evaluate the effectiveness of the management programme. Environmental Monitoring Programme will be conducted for various environmental components as per conditions stipulated in the Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

Table No: 1.4 Post Project Environmental Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Continuous monitoring weather station in core zone/ nearest IMD station	24 hours	Monthly Once	Wind speed, direction, Temperature, Relative humidity and Rainfall.
2	Air Pollution Monitoring – PM _{2.5} , PM ₁₀ , SO ₂ and NO _x	6 locations (One station in the core zone and at least one in nearby residential, area, one in the upwind, two station on the downwind direction and one in cross wind direction).	8 hours	Yearly Once	Fine Dust Sampler and Respirable Dust Sampler
3	Water Pollution Monitoring	Mine effluents, Set of grab samples during pre and post monsoon for ground and surface water in the vicinity.	–	Once in a year	Physico–chemical, microbiological characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1km at specific wells	-	Once in 6months	Water level monitoring devices may be used.
5	Noise	Mine Boundary, high noise generating areas within the lease and at the nearest residential area	24 hours	Monthly Once	Sound level meter
6	Vibration	At the nearest	–	During	Digital

		habitation (in case of reporting)		blasting operation	Seismograph
7	Soil	Core Zone and Buffer zone (Grab samples)	–	Once in a year	Physical and Chemical characteristics

1.7 Project Benefits

The proponent **Thiru.M.Saranraj**, is very much conscious of his obligations to society at large. Under plantation programme, it is suggested to develop green belt further all along the boundary of the quarry lease area. Apart from the green belts and aesthetic plantation for eliminating fugitive emissions and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community. The quarrying activity will create rural employment. In addition there will be indirect employment to many more people in the form of contractual jobs like construction of infrastructural facilities, transportation of Ordinary Stone to destinations, sanitation, supply of goods and services to the quarry and other community services etc. The local population will have preference to get an employment. The proponent will help in socio economic development of the village by providing educational facilities to children, and welfare amenities like drinking water to school; road and medical facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

1.8 Environmental Management Plan

The Environmental Management Plan (EMP) must be integrated into the process of quarry planning so that the ecological balance of the area is well maintained and adverse effects are minimized. EMP includes all preventive as well as mitigation measures to minimize the impacts on the environment. The Quarry Plan is for the production of Ordinary Stone without deep hole drilling and heavy blasting. Only controlled blasting is undertaken. Such limited quarrying activity is not likely to cause any impact adversely on the environment as far as pollution of air, water, land and noise is concerned.

1.9 Conclusion

As discussed, it is safe to mention that the project is not likely to cause significant impacts on the ecology and environment of the area, as adequate preventive measures will be adopted to contain the pollutants within permissible limits. The total operations shall be carried out with ease & minimum risk to the workers. The proposed Environmental Management Plan will keep the area in a safe environment with negligible impact on the environment. Plantation will substantiate the impact due to the quarrying activity. Quarrying activity will help in improving the socio-economic benefits in areas like employment, communication and infrastructure development.